Section 9-1: Add and Subtract Polynomials

By the end of this lesson, you should be able to:

- How do you write polynomials in standard form?
- How do you add and subtract polynomials?

Where you might see this in the real world:

- Part-time job, travel, geography, modeling

Define the following terms:

1. Monomial

2. Coefficient

3. Constant

4. Polynomial

5. Term

6. Binomial

7. Trinomial

8. Standard form

9. Like terms

We have dealt with polynomials throughout the year already, but we have not referred to them as such until now. A polynomial is nothing more than a collection of sums and differences of sums. A monomial has _____ term. A binomial has _____. Trinomials have _____. We usually see them written in standard from, which has the powers listed in descending order. The degree of the polynomial will be the highest exponent for the variable listed.

Example 1: Tell the variable for which the polynomial is arranged in standard form.

a. $2a^3 + 3ab - 4b^2$

b. $2(a+b)^3 + 3(a+b)^2 - 4(a+b) + 7$

When we are looking to add and subtract polynomials, we are going to combine like terms. This is just like what we were doing earlier in the year. It is imperative that

you make sure all variables and exponents are the same. If they are not the same, then we cannot combine the terms.

Example 2: Add the polynomials.

a. $(2x^2 - 3x + 7) + (-2x - 8) + (x^2 - 7x)$

b. $(3x^2 - 4xy) + (-x^2 + 4y^2) + (2xy - y^2)$

When we have subtraction, you need to be careful to subtract the whole polynomial. You can apply the distributive property to make sure you properly subtract each term.

Example 3: Subtract $4x + y$ from the sum of $x + 3y$ and $8x - 2y$.

Often times, you will just be told to simplify each expression. You will need to apply the rules of adding and subtracting polynomials.

Example 4: Simplify.

a. $(6x^3 + 3x^2 - 11x) + (2x^3 - 9x^2 - 5x)$

b. $(x^2y - 2xy^2 + 8) - (-7x^2y + 2xy^2 - 4)$

c. $(x^2y + x - xy^2) - (-y^2 + y + xy^2 + 4x^2y)$

Problem Set:

"Deeds, not stones, are the true monuments of the great." - John L. Motley